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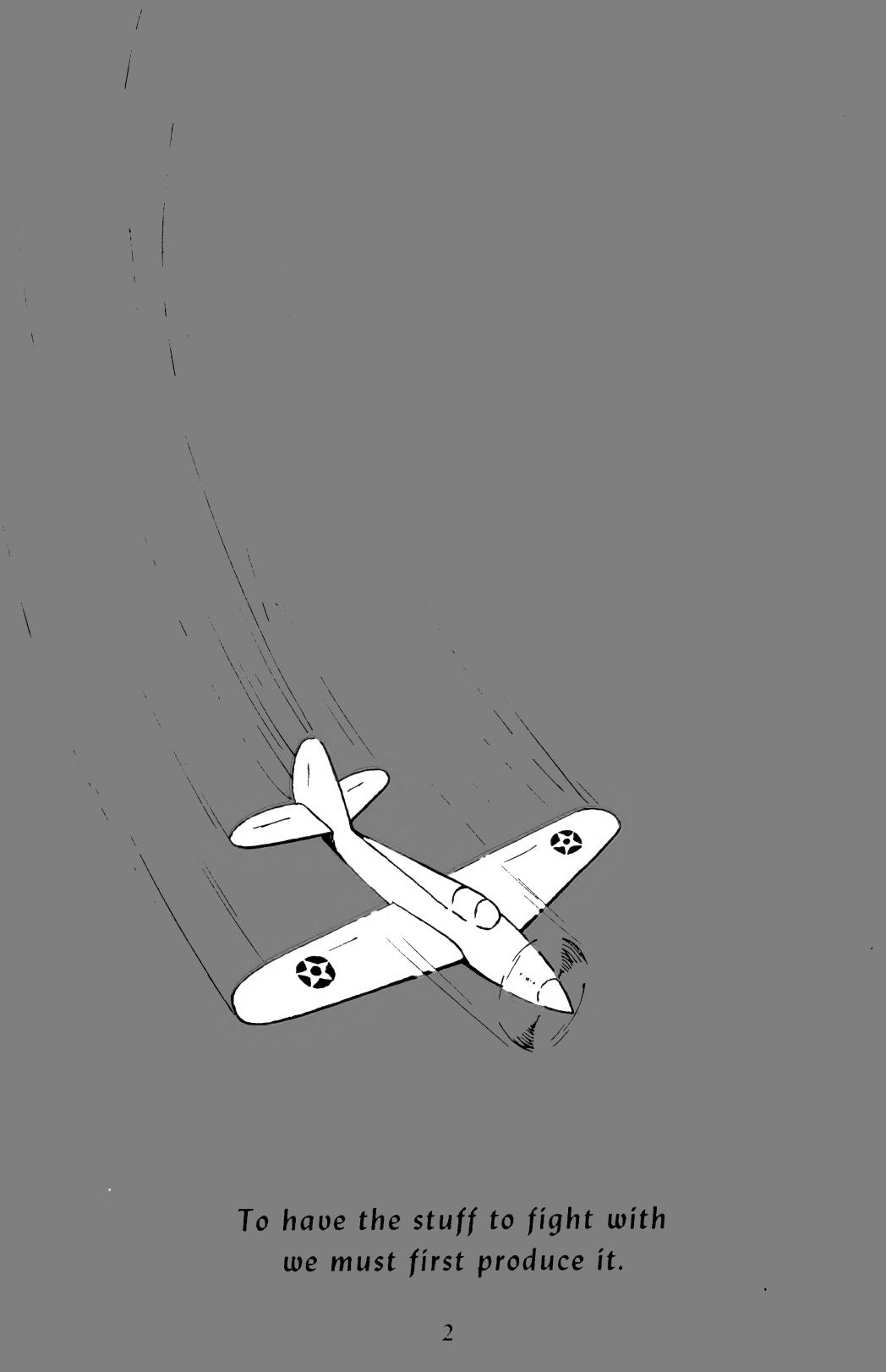
Eastern States Farmers' Exchange
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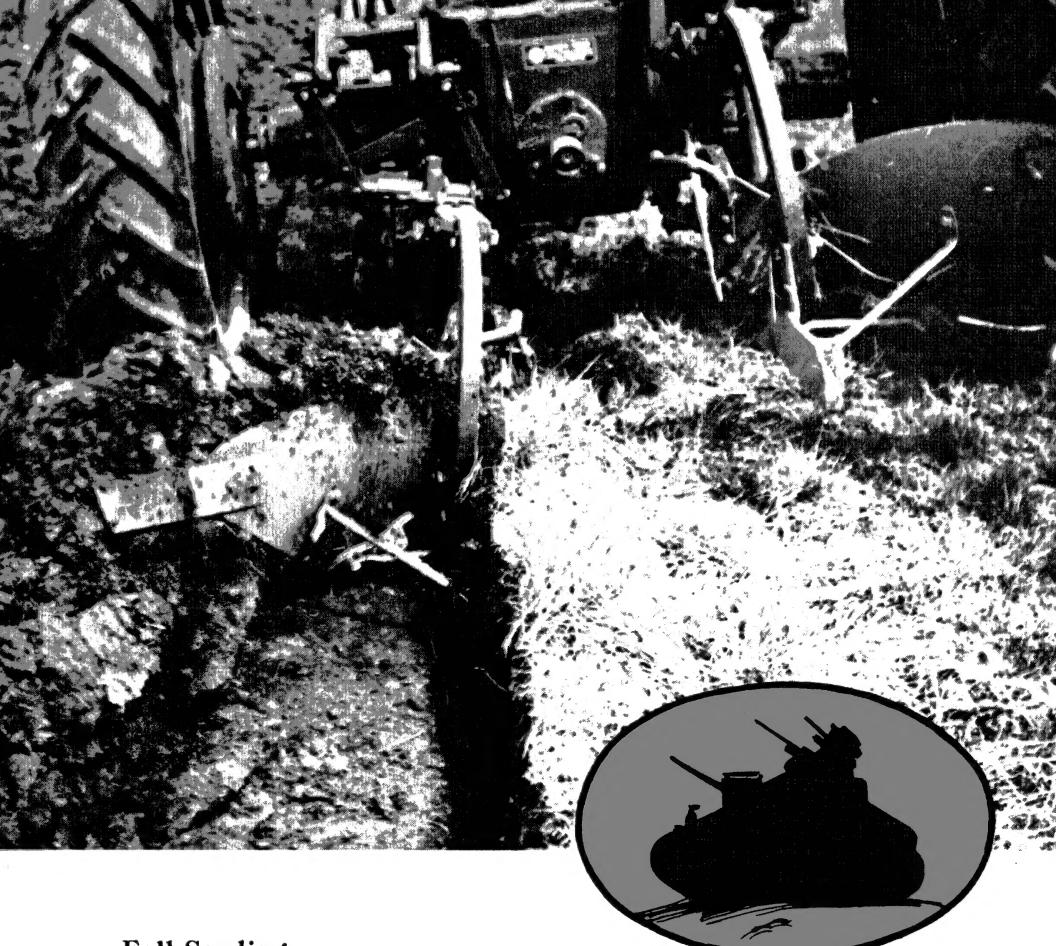


Fall Seedings

THAT HELP
WIN THE WAR



*To have the stuff to fight with
we must first produce it.*



Fall Seeding

Thousands of acres in Eastern States territory are seeded every September and October with winter grains and with grasses and legumes. These fall seedings are of tremendous importance in the production of cash crops to sell off the farm, in the production of home-raised grain and forage, and in soil maintenance and improvement. On some farms, fall seeded grains constitute the major cash crop produced and serve as companion crops for fall and spring seeded grasses and legumes. Other times fall seeded grains—either alone or in combinations— are used for fall and spring pastures, serve as a winter cover, and as a green manure later in the spring. Sometimes they are harvested for hay or silage. Grasses and legumes seeded in the fall are a major source of winter cover for soils and green manures the following spring as well as an important part of many hay, pasture and green feed crops.

Regardless of the purpose of the crop, the grower should be satisfied with nothing less than maximum returns, which can only be secured by the use of superior seed and seeding methods, a few of which are discussed in this little booklet prepared to help Eastern States members have more outstandingly successful fall seedings.

Crops and Combinations Suitable for Fall Seedings

For Grain Production

Forward Wheat
Nittany (Pa. 44) Wheat
Thorne Wheat
Kentucky #1 Barley
Rosen Rye

For Forage Production

Rye-Vetch (70-30) Mixture
Wheat-Vetch (70-30) Mixture
Timothy
Bluegrass
Redtop

For Green Manure or For Winter Cover

Selected Rye
Selected Wheat
Hairy Vetch
Rye-Vetch (70-30) Mixture
Wheat-Vetch (70-30) Mixture
Crimson Clover
Domestic Ryegrass

Preparation of the Seedbed

The seedbed for fall seeding should be loose and finely pulverized on the surface 3 to 4 inches while the soil below that should be firm and moist. Weeds should be well controlled and fertility should be at least moderately high.

When weeds have previously been kept down a most desirable physical condition of the seedbed can be prepared by thorough disking and harrowing. When it is necessary to plow, it should be done a long enough time (2 to 3 weeks) before seeding to afford sufficient firming of the bed and to provide plant material plowed under time to begin to decay.

The importance of a good seedbed cannot be too strongly emphasized. Thorough preparation may help in offsetting the effects of drought and other conditions unfavorable to the vigorous growth of the young seedlings. It always increases the chances for success with fall seedings.

Time of Seeding

Winter grains should be sown early enough to allow the plants to become well started before continued freezing weather begins. They should not however, be sown so early that they start jointing that fall. Where Hessian Fly is troublesome, wheat should not be sown until after the fly has laid its eggs. This time varies with season and location and can only be determined locally, but usually in the vicinity of Lancaster, Pennsylvania, wheat seeding after September 20 is safe; but should be delayed one day later for each 15 miles of distance farther south or for each 100 feet decrease in altitude. Likewise, it can be stepped ahead one day for each 15 miles of distance north or for each 100 feet increase in altitude. In Massachusetts wheat should be seeded early in September. Excessive dampness tends to hasten the emergence of the fly,



whereas drought delays it. In no case should seeding be delayed so long that plants do not make sufficient growth to withstand the winter.

Winter rye may be sown with safety from one to three weeks later than wheat. It will often live over winter if seeded only in time to allow sprouting before freezing weather, but much better results will be obtained both as a winter cover and as spring growth for green manure, forage or grain by seeding earlier than is ordinarily practiced. In tests at Arlington, Virginia, by the U S D A excellent results were obtained over a period of several years by sowing rye at the same time as wheat.

Hairy vetch is most commonly seeded with rye or wheat and their seeding periods are satisfactory for vetch except the very late dates possible for rye. Sometimes it is seeded alone for a green manure crop and as such should be sown in the latter part of August or as soon after September 1 as possible.

Winter barley should be sown a week to 10 days earlier than winter wheat.

Timothy and other grasses can well be sown with fall grains. From September 1 to October 15 is the most favorable period for sowing almost all grasses. Orchard grass, which is sometimes winter-killed, is an exception, but even orchard grass is frequently successful when sown in the fall. Kentucky bluegrass is so much safer when sown at this time that every possible effort should be made to sow lawns, pastures and other seedings containing bluegrass in the fall. Bluegrass does not form the root stocks which constitute a true sod until it has gone through one winter. Timothy is much more certain and much less seed is needed when fall sown than when spring sown.

Except for hairy vetch and crimson clover in the extreme southeastern part of Pennsylvania and in areas south of there, legumes should preferably be sown in the spring or summer — before September 1.

Rate of Seeding

The most desirable rate of seeding varies considerably with conditions. Factors which call for less seed are high germination, purity and general quality of the seed, a well prepared seedbed, high fertility of the soil, uniformity in distribution and in depth of covering, and timeliness of seeding.

With Eastern States seed of high germination, purity and general quality on medium fertile soil, 100 pounds of wheat or rye per acre is suggested. On highly productive soils with a well-prepared seedbed and early seeding, 60 to 75 pounds is sufficient. With winter barley these amounts should be increased by about 25 pounds per acre.

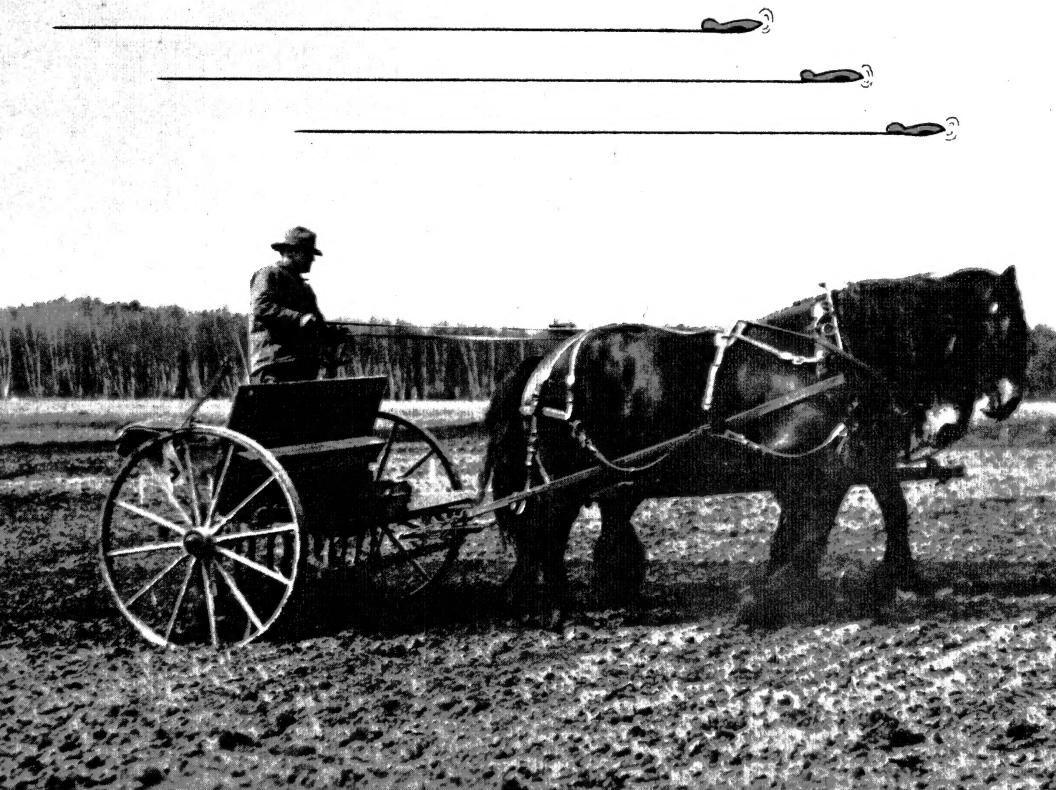
When a fall grain is to serve as a companion crop for fall and spring sown grass and legumes for forage, the amount of seed grain sown should not be so large that the grain smothers out or seriously inhibits the growth of the forage crop. Because of the ability of a grain crop to stool out and to a considerable extent to compensate in yield for fewer plants, a light seeding often yields as much grain as a heavy seeding with less injury to the accompanying grasses.

Vetch seeded alone needs 40 to 50 pounds per acre, while a mixture of 70 pounds of rye or wheat and 30 pounds of hairy vetch is a liberal seeding per acre.

When timothy is sown with wheat in the fall to be followed by clover or alfalfa in the spring, the rate of seeding should not exceed 3 to 5 pounds; otherwise the proportion of clover in the hay and the total yield of hay both in the year after seeding and the next year will be reduced. When brome grass is also sown 10 pounds of it per acre is a desirable amount.

In a grass mixture, 3 pounds of bluegrass and 2 pounds of redtop are usually enough per acre.

In the limited southern area where it is adapted, 10 pounds of crimson clover per acre can be added to a seeding of rye-vetch or wheat-vetch mixture.



Methods of Seeding

Fall seedings of both grains and grasses can be made either by drilling or broadcast. In experiments comparing the two methods of seeding grains, better yields have usually been obtained from drilling, and this is the method commonly used by Eastern States members. More uniform distribution of seed, and more uniform depth of covering, result in a higher percentage of germination and emergence, and a more even stand with less seed used. Some feel that the holding of snow by the ridges of soil left by the drill discs or hoes is beneficial.

On well-prepared seedbeds containing plenty of moisture 1 to $1\frac{1}{2}$ inches is a sufficient depth to sow winter grains and vetch. In dry seasons the depth should be 2 to 3 inches. Timothy and other grasses should be seeded about as shallow as possible and still be covered.

Where grain drills with seed attachments are used, a common and sound practice is to sow timothy at the same time as the grain. The seeder attachment tubes can be adjusted so that the seed will fall just behind the discs or hoes between the loose soil particles so that it will be covered by the first rainfall. Some drills are equipped

with chains to drag behind the discs or hoes to cover the grass seed lightly. If the grass seed is sown broadcast immediately after drilling the grain, it can be covered lightly with a spike-tooth harrow, a weeder or a brush drag.

Description of Eastern States Varieties

Forward Wheat — Developed by New York Experiment Station. Straw tall and stiff. Yellowish white chaff and beardless. Kernels red and of excellent milling quality for bread flour. It is resistant to loose smut and quite resistant to lodging even on heavy, fertile soils where it yields heavily. Like all beardless wheat it should be harvested in the hard dough stage to avoid loss from shattering. This seed is treated with an organic mercury dust for the control of seed-borne diseases.

Nittany (Pa. 44) Wheat — Developed by Pennsylvania Experiment Station. Very tall, vigorous and productive. It yields well on light soils and on soils of medium fertility, but has a tendency to lodge on heavy, rich soils. The chaff is white and bearded and the straw purplish. The kernel is red and of good milling quality. It will stand more handling when ripe without shattering than will beardless varieties. This seed is treated with an organic mercury dust for the control of seed-borne diseases.

Thorne Wheat — Developed by Ohio Experiment Station. Straw tall and stiff. The head is carried erect with brown beardless chaff and red kernels of good milling quality. It is highly resistant to both loose and stinking smut, but susceptible to leaf rust and to stem rust. A very heavy yielder under a wide variety of conditions. This seed is treated with an organic mercury dust for the control of seed-borne diseases.

Rosen Rye — Produced under certification by Michigan Seed Improvement Association from stock seed propagated in isolation on South Manitou Island in Lake Michigan. The plant is very winter-hardy and vigorous even at low temperatures. It stools prolifically. The straw is tall and stiff and strong. The long compact heads have four complete rows of long, plump, attractive green kernels which do not shatter readily during harvest. This is a pure strain of the outstanding variety of winter rye.

Kentucky #1 Barley — A high-yielding, six-row, winter-hardy, rough-bearded variety resulting from selection by Kentucky Experiment Station from *Tennessee Winter*. Adapted in Eastern States territory only to southern Pennsylvania, Maryland and Delaware, but where adapted it is a highly desirable source of home-raised feed. It is less susceptible to smut and to lodging than many varieties of winter barley. These are still two of the most serious troubles affecting profitable production.

All Eastern States seed is produced on contract from hot-water treated stock seed and is itself treated with an organic mercury dust for control of smut and other seed-borne diseases. Even with all

SUPPLEMENT FOR 1944

Page 4 - Additions

Crops for grain production include Wong Barley.

Crops for forage production include Smooth Brome-grass and Reed Canary Grass.

Page 4 - Correction

In preparation of the seedbed, 2 inches of loose and finely pulverized soil on the surface is sufficient.

Page 8 - Correction

THORNE WHEAT ONLY - Experiment station tests and farmers' experiences have been so outstandingly favorable to Thorne wheat in comparison to all other varieties that Eastern States distribution of winter wheat seed will be confined to this variety in 1944.

Page 8 - Addition

WONG WINTER BARLEY - This variety developed by New York Agricultural Experiment Station was first available for limited planting by farmers in the fall of 1942. Its outstanding merit is its resistance to lodging, superior to any other important variety. Its splendid standing ability makes it easy to harvest and much kinder to accompanying grass-legume seedlings. It is also highly resistant to mildew and to smut. Its yields in tests in several states to date have been equal to the best other varieties. It has very short awns or beards which bother very little in harvesting and threshing. It is probably somewhat less winter-hardy than Kentucky No. 1 and some loss may occur during a severe winter on areas with little snow cover.

Page 12 - Correction

Smooth Bromegrass should be in heavy type comparable to timothy and redtop.

Page 12 - Addition

REED CANARY GRASS - A valuable crop for pasture or hay on fertile, moist, swampy areas. Being covered with water during the winter or dormant season seems to actually benefit this grass. It is a hardy, somewhat coarse but leafy perennial which spreads by short creeping underground root-stalks, and in a few years forms a thick heavy turf which will hold up cattle and machinery even when the soil is wet and soft.

Its best use is for pasture but it also makes nutritious palatable hay or silage. It endures heavy grazing but may grow as much as six feet tall, producing per acre from two cuttings 3 to 4 tons of hay higher in feeding value than timothy.

It is best seeded in the early spring on land prepared the previous summer or fall. When this is not feasible it may be seeded in late August so that the seedlings will get sufficient start to withstand the winter or it may be seeded in late fall after growing weather has passed so the seed will not start germination until early the next spring. Seeding in late spring, early summer or early fall should be avoided.

Prepare a fine, smooth, firm seedbed. Broadcast 5 to 7 pounds of seed per acre covering $\frac{1}{4}$ to $\frac{1}{2}$ inch. A grain companion crop will usually result in a poorer grass seeding. Two or three pounds of timothy may help on the first year's crop and will be crowded out as the canary grass spreads.

The seeds mature unevenly so some immature seeds are present in all lots. Some seeds germinate slowly

resulting in thin stands in early stages. Weeds may have to be controlled the first year by clipping but are seldom troublesome after the first year.

Seedings should not be pastured the first year but can be cut for hay when the first heads appear if the land is dry enough to get on to. In later years Reed Canary Grass can be pastured the entire season beginning in May if the ground is not too wet.

FALL SEEDING OF LAWNS

Late summer and fall seeding of lawns is much preferable to spring or early summer seeding because of less competition from weeds, better opportunity to prepare a fine, firm seedbed, warm soil conducive to quick germination and ample moisture with cool growing weather better suited to grass development. Only about one-half as much seed is required as for spring seedings - $2\frac{1}{2}$ pounds per 1,000 sq. ft. in the fall compared to 5 pounds per 1,000 sq. ft. in the spring.

Eastern States Velvet Green Lawn Grass Mixture is composed of

35% Kentucky Bluegrass
25% Chewings Fescue
10% Creeping Red Fescue
15% Rhode Island or Colonial Bentgrass
15% Domestic Ryegrass

This mixture can be used to develop a desirable lawn either in direct sun or in moderate shade. Although liked by some, clover is generally considered undesirable in lawns. So avoid the use of lime unless needed for the grasses. A reaction of 5.5 or 6.0 pH is usually satisfactory.

Prepare a seedbed very fine on top and firm underneath. The more organic matter which is present that is thoroughly decayed the better will be the moisture holding capacity, aeration and productivity of the soil.

Fertilize the soil liberally before seeding. Twenty to 25 pounds of a fertilizer such as 5-10-5 analysis thoroughly and uniformly mixed into the soil of each 1000 square feet is suggested.

Sow the seed carefully to get uniform distribution and covering.

Divide the seed into at least two and preferably four parts and seed the area crosswise in different directions. Cover lightly - not more than $\frac{1}{4}$ inch. If no seeds are visible on the surface it is likely that most seeds are in too deep. Roll again after seeding and water thoroughly if needed and possible.



these precautions it is not impossible for as much as 10 percent of smut to occur in fields planted with Eastern States seed. The yield, however, is usually better than from untreated seed or from other varieties which may appear to have less smut.

Selected Wheat — A winter-hardy, vigorous-growing type thoroughly cleaned and tested to assure high purity and germination. It is intended for use in production of forage, winter cover or green manure and not in grain production so is not chemically treated for the control of seed-borne grain diseases.

Selected Rye — This seed is of selected lots of Rosen-type rye which may, however, be several generations removed from pure foundation stock seed. It is equally well adapted, winter-hardy, thoroughly cleaned and of a high germination. It is lower in cost than certified *Rosen*, but is not at all in the "cheap seed" class of ordinary feeding rye frequently offered as "suitable for seeding". It offers superior value as seed for production of forage, winter cover, or green manure. For grain production use *Eastern States Rosen Rye*.

Farmers who intend to grow grain for seed should first know the requirements for state certification and the measures necessary to

carry out to meet those requirements. Even with the best stock seed obtainable and with crop rotation, some roguing of foreign plants is required because weeds and other crop seeds may appear as impurities in the stock seed used or volunteer in the field of production. The seed grower must assume the expense of roguing, as he does of seed treatment and other refinements if he is to be distinguished as a seed grower instead of merely a multiplier of seed; and after years of experience as a seed grower he will realize how impossible it is to produce and distribute *perfect* seed. He may hope and strive, however, to attain a high degree of excellence.

Hairy Vetch — This is a viny legume well adapted for early fall seeding to produce winter cover, green manure or forage. It is definitely a cool weather crop and is tolerant to cold weather and to drought, doing best on light soils, but also often producing well on clay soils if they are well drained. It makes little top growth, but produces tremendous root growth in fall and winter and then very rapid top growth the following spring.

The forage from vetch has the highest feeding value of the legumes and the plant is a strong gatherer of air nitrogen when properly inoculated and adequately supplied with calcium, phosphorus and potash. Each bag of Eastern States vetch seed contains a can of inoculant together with directions for its proper use. An acre of well inoculated and fertilized vetch may gather from the air and fix in the soil as much as 100 pounds of nitrogen — an amount equivalent to the nitrogen in 600 pounds of nitrate of soda.

Hairy vetch is seldom sown alone because of its viny habit of growth, but is commonly fall-sown with wheat or rye for support. It should not be used where the rye or wheat is to be harvested for grain in a short grain rotation, for some vetch seed is hard enough to lie dormant for a year or more in the soil or some may shatter and reseed and become a pest in later grain crops. The seeds are round, nearly black (yellow inside) and mature in July or August.

Rye-Vetch Mixture — This is a natural mixture of *Selected Rye* and *Hairy Vetch* standardized to the proportions of 70 parts of rye to 30 parts of vetch. It is thoroughly cleaned of all other crop seeds, weeds and inert matter and each ingredient is tested to assure high germination.

It is recommended for use in the production of forage, winter cover or green manure where it can be seeded early enough for the vetch and where a crop with more protein or with nitrogen gathering properties is desired. An early fall seeding of this mixture, which may provide pasturage both late in the fall and early in the spring, will serve as a cover crop over winter and as a green manure after spring grazing. It enriches the soil with free air nitrogen.

A can of bacteria inoculant for the vetch is included in each bag and should be applied to the seed mixture according to directions on the can before seeding.



Wheat-Vetch Mixture — This is a natural mixture of *Selected Wheat* and *Hairy Vetch* standardized to the proportion of 70 parts wheat to 30 parts vetch. Both are winter-hardy and of high germination and the mixture is free from impurities in the form of seeds of other crops or of weeds, and of inert matter.

With early fall seeding this mixture should yield greater benefits than selected wheat alone. Forage produced will have higher feeding value and tonnage should be greater. Through the nitrogen-fixation by the vetch, soil improvement will be greater.

A can of bacteria inoculant for the vetch is included in each bag and should be applied to the seed mixture according to directions on the can before seeding.

Timothy — This is the most common hay species grown in the Northeast and the one most generally seeded in all hayland and pasture mixtures. It is seldom winter-killed and is exceptionally persistent. It stools abundantly and tends to increase the yield and dependability of the forage stand and is of high nutritive value when soil fertility is maintained at a high level and when the crop is cut at the proper stage (early bloom).

A mixture of timothy with legumes is usually easier to cure and more palatable to livestock than the legumes alone, but it is preferable to sow the legumes early the following spring unless sown early enough in the fall (late August or early September) to become well established before winter.

Timothy's one weakness as a pasture grass is its slowness to recover and make abundant "second growth" after being cut or grazed. Many special strains of timothy for hay or for pasture are being selected or developed, but the seed of no especially superior strain is yet available in commercial quantities.

Eastern States timothy seed is carefully purchased, cleaned, and tested to assure high viability and freedom from seeds of other crops and of weeds.

Smooth Brome Grass is one of the most winter-hardy and drought-resistant perennial grasses. It is very palatable to all livestock either as hay or pasture even when fairly mature. Grown on fertile soil or in legume combinations it is highly nutritious and a mixture of brome with alfalfa or ladino is much easier to cure for hay than the legumes alone. Unlike timothy, it recovers quickly after cutting or pasturing and makes good successive crops the same season. It starts growth slowly and is usually more productive after the first season.

Although more often spring sown, August or early September seedings are very satisfactory. Because the seed is light and wing-tipped it cannot satisfactorily be sown mixed with other grasses and legumes, but can be mixed with a light seeding of oats or possibly with barley or wheat or with fertilizer through a grain drill.

Redtop — This perennial grass is especially tolerant to acidity and to wet soils; otherwise it has little justification for use in a seeding mixture. It is fine-textured and palatable when harvested young. The seeds are extremely small (4 to 6 million per pound) and the plant is aggressive and spreads by underground stolons, so only a few pounds of seed per acre should ever be sown in a mixture.

All Eastern States seed is of the "Fancy Solid" grade containing the minimum amount of the chaff so common in redtop seed. The legal weight per bushel of redtop seed is 14 pounds while Eastern States seed averages 40 pounds or better.

Fertilizer for Fall-Seeded Forage Crops

Most forage crop seedings remain "down" for from two to several years. The number of years during which they will continue to produce and the annual yields will be determined in large part by the fertility foundation built into soils *before* they are seeded.

When forage and winter grain crops are seeded together, the mineral fertilizer treatment should be one which will meet the needs of *both*. A fertilizer application of from 125 to 250 pounds per acre of *Eastern States* 0-24-12 for grain alone should have added to it



another 100 pounds or more for the benefit of the forage crop remaining after the grain is removed.

For straight seedings of crops for forage production — rye or wheat with vetch — fertilizer containing equal parts of phosphoric acid and potash is recommended. *Eastern States 0-20-20* is used by many members for fertilizing forage crop seedings.

Fertilizer for Green Manure or Winter Cover Crops

The fertilization of these crops serves two important purposes: first, it helps to increase yield and thus make more organic matter to plow down; second, it builds into soil a greater supply of nutrients to be used by the cash crops which follow. *Eastern States 0-20-20* furnishes an excellent balance of phosphoric acid and potash for green manure and cover crop fertilization. Recommended rates of application are at from 200 to 400 pounds to the acre.

Green manure crops decompose more rapidly after plowing down when they have been well supplied with lime and the mineral nutrients, phosphoric acid and potash. Legume crops will develop greater growth and perform more efficiently as nitrogen-producing

plants. Cash crops seeded the following year will make more efficient use of available fertilizer nitrogen when the soils in which they grow contain an abundant supply of these essential nutrients.

Adding potash to the normal application of superphosphate will increase yields of winter grains on many northeastern farms. A satisfactory "balance" of the two nutrients in a fertilizer is two parts of phosphoric acid to one part of potash. *Eastern States 0-24-12*, manufactured at the Wilmington, Delaware, fertilizer plant for distribution in Delaware, Maryland and Pennsylvania is widely used as a fertilizer for fall grains. Recommended rates of application are from 125 to 250 pounds to the acre.

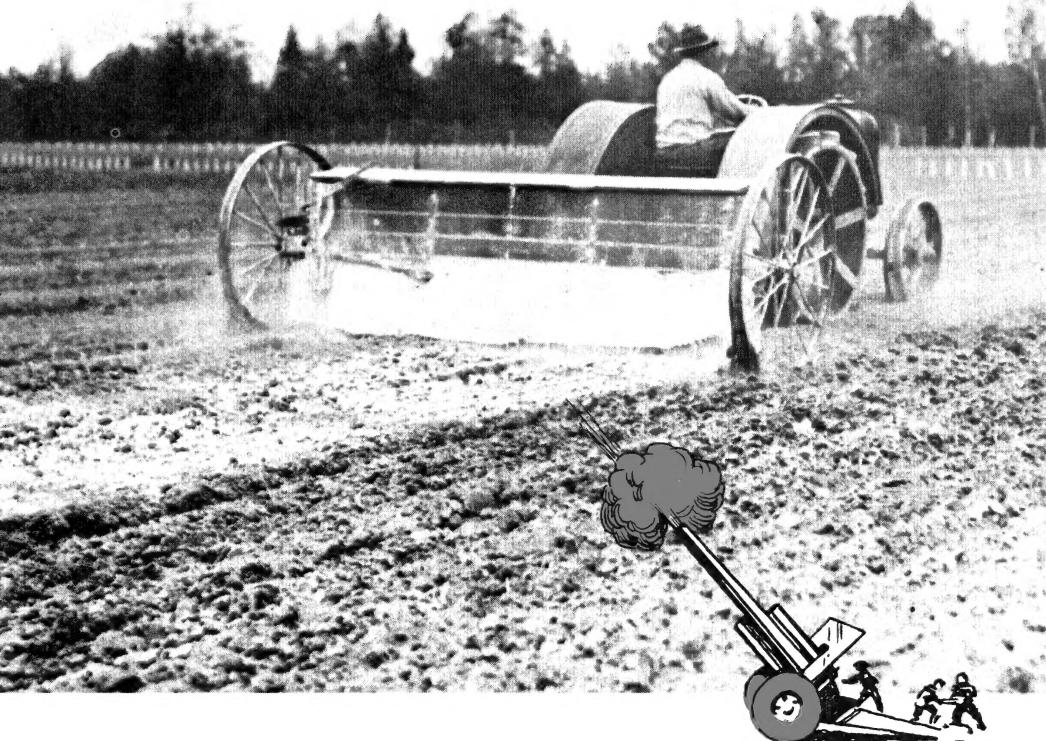
Nitrogen is an essential nutrient for fall-seeded grain crops grown on "thin" soils. Since fertilizer nitrogen probably will not be available to winter grain crops while the war lasts, manure can be the source of that nutrient on many farms. Light applications of manure (about five loads to the acre) while the seedbed is being prepared will help to get the crop off to a good start. Light topdressing during the winter or early spring will also furnish needed nitrogen and at the same time furnish protection against winter injury.

Crimson Clover can be sown in early fall (late August or early September) in extreme southeastern Pennsylvania, Delaware and Maryland. Its chief use is for soil improvement and winter cover, but it is also sometimes used for pasture and hay when it should be fed or harvested before full bloom. The seed germinates readily with little moisture, but the seedlings are somewhat sensitive to adversity, hence careful seeding on a well-prepared seedbed is essential. Seed more than two years old seldom has sufficient viability to make it suitable for use.

Planning Fertility for Field Crops

The grower who is satisfied with nothing less than maximum returns from his fall seedings will pay close attention to soil needs for plant nutrients, including lime. An important part of seedbed preparation is the incorporation of plant nutrients essential to full crop development. Previous crop history frequently is the basis for deciding the lime and fertilizer application, and is often a good guide. Even a more accurate measuring stick for soil requirements is the soil test, which is being employed more and more by farmers in the Northeast. The test will take much of the "guess" out of fertilizer application and help to assure greater returns for each dollar invested in plant food.

Soil requirements for lime should be determined and satisfied in preparation for fall seedings. Then is the opportunity, while the seedbed is being prepared, for lime to be worked *into* soil where its maximum value in use can be realized. This practice is no less important for the green manure crop which will be plowed under and followed by a "cash" crop than for the seeding which will remain down for a period of time.



Limestone is a desirable "lime" commodity for most fall seedings. While its immediate action is less rapid than with hydrated or burned lime, it combines the advantages of some immediately available soil sweetening properties plus continued action over an extended period of time. Relatively few fields need the full and immediate effects of the more active forms of lime. Limestone usually costs the least.

Fertilizer For Fall-Seeded Grain Crops

After lime, the nutrient needs of fall-seeded grains are usually in their order of importance as follows: (1) Phosphoric Acid, (2) Potash, (3) Nitrogen.

When a limited per-acre-investment is made in purchased plant food, superphosphate alone may be a sound selection. Either 20% or 47% *Superphosphate* can be used on grain crops with equally good returns from applications of equal quantities of plant food. The cost of plant food will be less in 47% *Superphosphate*, but machinery for applying the "High Analysis" superphosphate must be adjusted to reduced rates of application.



EASTERN STATES FARMERS' EXCHANGE

BOX 1482

SPRINGFIELD, MASSACHUSETTS